

NEW CLAIMS

11. A vacuum processing apparatus for applying a designated process on an object to be processed in a vacuum atmosphere, said apparatus comprising:
 - a processing vessel for applying the designated process to the object introduced thereinto;
 - a susceptor located in the processing vessel for mounting the object thereon;
 - a toroidal shaped vacuum pump including a motor therein for sucking exhaust gas from the processing vessel to form a vacuum in the vessel, the toroidal shaped vacuum pump being arranged below the processing vessel and being coaxial with the susceptor, the toroidal shaped vacuum pump defining a column-shaped space that is surrounded by the vacuum pump and that is located below the susceptor; and
 - a driving mechanism arranged below the susceptor for moving the susceptor up and down, at least a part of the driving mechanism being received within the column-shaped space surrounded by the toroidal vacuum pump.

12. A vacuum processing apparatus for applying a designated process on an object to be processed in a vacuum atmosphere, said apparatus comprising:
 - a processing vessel for applying the designated process to the object introduced thereinto;
 - a susceptor located in the processing vessel for mounting the object thereon;
 - a toroidal shaped vacuum pump for sucking exhaust gas from the processing vessel to form a vacuum in the vessel, the toroidal shaped vacuum pump being arranged below the processing vessel and being coaxial with the susceptor, the toroidal shaped vacuum pump defining a column-shaped space that is surrounded by the vacuum pump and that is located below the susceptor; and
 - a driving mechanism arranged below the susceptor for moving the susceptor up and down, at least a part of the driving mechanism being received within the column-shaped space surrounded by the torodial vacuum pump.

13. A vacuum processing apparatus for applying a designated process on an object to be processed in a vacuum atmosphere, said apparatus comprising:

a processing vessel for applying the designated process to the object introduced thereinto; a susceptor located in the processing vessel for mounting the object thereon; an exhaust means for sucking exhaust gas from the processing vessel to form a vacuum in the vessel, the exhaust means being arranged below the processing vessel and being coaxial with the susceptor, the exhaust means defining a column-shaped space that is surrounded by the exhaust means and that is located below the susceptor; and

a driving mechanism arranged below the susceptor for moving the susceptor up and down, at least a part of the driving mechanism being received within the column-shaped space surrounded by the exhaust means.

14. A vacuum processing apparatus for applying a designated process on an object to be processed in a vacuum atmosphere, comprising:

a processing vessel for applying the designated process on the object introduced thereinto, the processing vessel being provided, therein, with a susceptor for mounting the object thereon;

a vacuum pump constructed cylindrically as a whole and arranged below the susceptor in the processing vessel so as to be coaxial with the processing vessel, for sucking exhaust gas in the processing vessel thereby to form a vacuum, the vacuum pump including:

a cylindrical inner housing arranged coaxially with the processing vessel,
a cylindrical motor stator arranged outside the cylindrical inner housing,
a number of rotors rotatably arranged with respect to the cylindrical motor stator,
a cylindrical inner housing arranged outside the rotors, and
a number of stators fixed to the cylindrical outer housing so as to each extend between the adjacent rotors; and

a driving mechanism arranged below the susceptor, for moving it up and down, wherein the vacuum pump is arranged around at least a portion of the driving mechanism coaxially therewith.